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INTEGRATED CROP MANAGEMENT

Managing soils under dry conditions

The dry conditions during the last two months in Iowa present a challenge in planning for next year's field work, especially if the drought persists. Although it is still a little early to predict rainfall and its capacity to build soil moisture in the soil profile, producers should plan fall tillage carefully.

Tillage of the soil surface leads to loss of moisture that may be needed next spring. Soil with surface cracks allows deeper infiltration of rainfall without extra tillage for fracturing the compacted soil surface layer.

Soil management planning and implementation are fundamental to successfully conserve soil moisture. Prior to tilling, inspect the top 6 inches of soil to determine soil moisture status. If soil moisture is below the field capacity, minimize the number of tillage passes or practice no-till farming to conserve soil moisture. Plan for enough residue cover to be left on the soil surface after harvest to help conserve soil moisture for next spring.

Top 10 ways to leave more residues on the soil surface:

1. Follow a crop rotation sequence that includes high-residue crops (e.g., soybean does not provide the same protection as corn, or a cover crop such as oats or alfalfa).
2. If you must use tillage, wait until spring.
3. Reduce the number of tillage passes.
4. Plant rye or wheat as a winter cover crop, especially following low-residue crops such as soybean.
5. Set chisels and disks to work shallower.
6. Scrap the moldboard plow.
7. Drive slower on tillage operations--driving fast throws more soil and covers residue.
8. Use straight shanks and sweeps on chisel plows; twisted shanks can bury 20 percent more residue.
9. No-till drill soybean instead of planting them conventionally--no-till drilling keeps more residues on the soil surface and generally produces a quicker canopy.
10. Convert to a no-till tillage management system.

Conservation practices play a major role in managing soil moisture conditions. The absence or reduction of soil disturbance in no-till both minimizes soil moisture loss from the soil surface and maximizes soil moisture storage. They also enhance beneficial soil physical properties such as increased infiltration rate, maintenance of soil macropores, and reduction of surface runoff during rainfall, thus increasing soil moisture storage.

Soils that received primary tillage during fall may need to be leveled with a secondary tillage

operation before planting. Two calendar strategies can be used to conserve soil moisture: early spring or just before planting. With an early spring strategy, the soil is opened up for some drying, but any spring rain that does occur can cause soil erosion. With a late spring strategy, the tillage and leveling operation is delayed until as close to planting time as possible. Using tillage just before planting preserves soil moisture present in the tilled depth and reduces soil moisture loss before planting.

Know your soil

If it has poor internal drainage, consider light tillage passes with a field cultivator or disk just before planting. This strategy dries the surface enough to plant without causing undue moisture loss. For soils with adequate internal drainage, no-till may offer the best management choice, particularly under dry conditions such as in this year.

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